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Relatively light walling in single-storey residential buildings in rural areas

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ABSTRACT

The scientific article provides some considerations for the use of relatively new heat and sound insulation materials. As fencing, load-bearing, self-supporting structures, as well as for the walls of external auxiliary premises, the replacement of masonry with other alternatives is proposed. The authors offer ideas on the use of some lightweight concrete, such as foam concrete, the production of which at present can reduce the cost of building exemplary residential buildings.

Keywords: Light walling, single-story residential buildings, rural areas, Uzbekistan

1. INTRODUCTION

Thanks to large-scale reforms carried out under the leadership of the President of the Republic of Uzbekistan, the economy, small business is developing in all areas of the country, the appearance of cities and villages has changed beyond recognition. Thanks to the creation of favorable conditions and the growth of incomes of the population over the years of independence, the living conditions of our citizens are changing radically. The subject of special attention is the implementation of a targeted state program for the construction of individual housing according to standard projects in rural areas. When designing these facilities, working drawings and estimate documentation are updated annually with quality and economic ideas, new construction materials and technologies are being introduced. In this case, the main goal is to improve the quality of construction and installation works, reduce construction time and of course take into account the comments and suggestions of the owners of residential houses. [1]

With the expansion of individual construction in the Republic of Uzbekistan, the demand for construction materials is increasing every day. In this regard, the creation and provision of the construction industry with new, local, cost-effective and efficient building materials is the most important task of developing the national economy of the Republic of Uzbekistan.

Рис.1. План стен М1:100



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2. LITERATURE REVIEW

As we know, in the residential houses under construction, materials for the fencing of exterior walls 380 mm thick - burnt brick are currently used. New requirements introduced since 2011 do not allow the use of bricks for exterior walls without additional thermal protection of buildings. Otherwise, it is necessary to use a wall thickness not lower than 510 mm, which will lead to inexpediency from the economic and technical side. In addition, a significant increase in the consumption of material and labor resources in construction. With increasing wall thickness, the use of traditional structural insulation materials can lead to a more dramatic increase in the own weight of buildings and structures and, accordingly, seismic load, compared to traditional solutions, which is unacceptable. Therefore, at present it is necessary to fully develop research, production and technical base and the use of effective thermal insulation materials and lightweight enclosing structures. It should also be noted the prospects of using foam concrete in low-rise construction instead of the widely used brickwork. [1,2,3]

For example, the use of heat-insulating materials and products in the construction of residential, industrial and public buildings allows to provide high heat and sound insulation properties of building structures and reduce the thickness and mass of walls and other enclosing structures, including the walls and partitions of household extensions of household plots of rural residential buildings Consequently, the consumption of basic building materials (cement, metal, bricks), including labor savings and lower construction costs vstv. [1,4,5]



Рис. 2. Кладка из пенобетона



Рис.3. Фасад образцового дома

3. MAIN PART

The use of lightweight concrete in construction allows, on the one hand, to reduce the mass of the building structure, and on the other hand, to improve the thermal performance properties of the structures. In the process of industrialization of construction it is planned to reduce the costs of material, labor and financial resources. One of the ways to reduce costs is to use lightweight concrete from local raw materials (one of the main components of which is fine-grained washed local sand). This material is foam concrete, which is already used in many countries around the world.

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Foam concrete is a type of light cellular concrete having a porous structure. Due to the presence of fine pores filled with air, foam concrete has a very low density, which means its bulk weight is lighter than other materials used in this area

Depending on the brand in terms of average density, foam concrete is used both as a heat-insulating material, having a predominantly closed porosity, and as a structural heat-insulating material for enclosing structures, and also as a construction material.

For modern housing construction, it is necessary to introduce innovations with the replacement or alternation of bricks and lightweight concrete in such areas (structures) of the object as load-bearing walls, partitions, self-supporting walls, outbuildings, storage facilities, fences, outdoor latrines and other objects in one-story buildings not demanding special constructive efforts.

4. CONCLUSION

Foam concrete that underlies production does not age and does not change its properties with time. Environmentally friendly material is not inferior to stone in terms of strength, it is distinguished by high-quality sound and thermal insulation characteristics, it repels water, is refractory, convenient to install, has an acceptable cost. Foam block cannot be called innovative material. It is the basis for the construction of modern houses over the past 7-10 years.

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